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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,827	03/23/2000	Krzysztof Matyjaszewski	00093	9987

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EXAMINER

CHEUNG, WILLIAM K

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/534,827

Applicant(s)

MATYJASZEWSKI ET AL.

Examiner

William K. Cheung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 86-162, 224-229 and 270-272 is/are pending in the application.
- 4a) Of the above claim(s) 140-150, 159-162, 224-229 and 270 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 86-139, 151-158, 271 and 272 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>021004, 032300</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's affirmed election of Group I invention, claims 86-139, 151-158, 271-272, without traverse is acknowledged. Therefore, in view of lack of traversal to restriction requirement set forth from Response to Restriction Requirement, the restriction set forth by the examiner is deemed proper and is therefore made Final.
2. Claims 86-162, 224-229, 270-272 are pending. Claims 140-150, 159-162, 224-229, and 270 are drawn to non-elected subject matter. Claims 86-139, 151-158, 271-272 are examined with merit.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 86-139 are rejected under 35 U.S.C. 102(e) as being anticipated by Matyjaszewski et al. (US 5,945,491 or US 6,111,022).

*The invention of claims 86-106 relates to a **process** for atom transfer radical addition for adding functionality to an oligomer or polymer, comprising:*

reacting a first oligomer or polymer having a radically transferable atom or group with a second compound having a first desired functional group, the second compound reactive with the first oligomer or polymer after removal of the radically transferable atom or group, in the presence of a system initially comprising:

a catalyst which participates in a reversible cycle with the first oligomer or polymer.

The invention of claims 107-117 relates to a **process** for a catalytic atom transfer fictionalization of oligo/polymeric materials having one or more radically transferable atom(s) or group(s), comprising the steps:

providing a polymer having a radically transferable atom or group; and
adding a compound containing a α,α -disubstituted olefin group to the
polymer in the presence of a **transition metal complex** capable of undergoing a redox reaction with the **radically transferable atom or group**, resulting in the **addition of the compound containing the α,α -disubstituted olefin group at the site of the radically transferable atom or group and an elimination reaction involving the radically transferable atom or group to form a reactive unsaturated group.**

The invention of claims 118-139 relates to a **process** for a catalytic atom transfer coupling of polymers comprising:

providing a first polymer having a first radically transferable atom or group;
adding a coupling compound containing one or more α,α -disubstituted olefin group(s) to the first polymer in the presence of a transition metal complex
capable of undergoing a redox reaction with the first radically transferable atom or group, resulting in the addition of the coupling compound containing the α,α -disubstituted olefin group at the site of the first radically transferable atom or group and an elimination reaction comprising the radically transferable atom or group to form a reactive double bond; and **allowing a second polymer having a second radically**

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transferable atom or group in the presence of the transition metal complex to add to the reactive double bond.

Matyjaszeski et al. (abstract) disclose a process of atom transfer radical polymerization for the synthesis of novel homopolymer or a block or graft copolymer. Matyjaszeski et al. (col. 16, last line of the reaction Scheme 3; col. 17, the first and the last line of the reaction Scheme 3) clearly disclose adding a coupling compound containing one or more α,α -disubstituted olefin group(s) to the first polymer in the presence of a transition metal complex capable of undergoing a redox reaction with the first radically transferable atom or group, resulting in the addition of the coupling compound containing the α,α -disubstituted olefin group at the site of the first radically transferable atom or group and an elimination reaction comprising the radically transferable atom or group to form a reactive double bond. Therefore, the invention of Claims 86-139 is anticipated.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 151-158, 271-272 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matyjaszewski et al. (US 5,945,491) in view of Patten et al., "Atom Transfer Radical Polymerization and the Synthesis of Polymeric Materials", *Advanced Materials* 1998, 10 No. 12, page 901-915.

*The invention of claims 151-158 relates to a **controlled polymerization process**, comprising:*

adding a core forming compound to an active atom transfer radical polymerization process; and

forming a multi-arm star copolymer wherein polymers react with the core forming compound to form the star compound.

*The invention of claims 271-272 relates to the **controlled polymerization process** for the production of*

telefunctional multi-arm star copolymers, comprising:

polymerizing a free radically (co)polymerizable monomer in the presence of a system comprising:

a telefunctional multi-armed star initiator synthesized from free radically copolymerizable monomers, a first initiator with one radically transferable atom or group, and a divinyl compound.

Matyjaszewski et al. (abstract) disclose a process of atom transfer radical polymerization for the synthesis of novel homopolymer or a block or graft copolymer. Matyjaszewski et al. (col. 16, last line of the reaction Scheme 3; col. 17, the first and the last line of the reaction Scheme 3) clearly disclose adding a coupling compound containing one or more α,α -disubstituted olefin group(s) to the first polymer in the presence of a transition metal complex capable of undergoing a redox reaction with the first radically transferable atom or group, resulting in the addition of the coupling compound containing the α,α -disubstituted olefin group at the site of the first radically transferable atom or group and an elimination reaction comprising the radically transferable atom or group to form a reactive double bond.

The difference between the invention of claims 151-158, 271-272 and Matyjaszewski et al. is that Matyjaszewski et al. are silent on a process comprising a core forming compound or a telefunctional multi-armed star copolymers.

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Patten et al. (page 901, Figure 1) disclose that a core forming compound or a telefunctional multi-armed star copolymers can be prepared by atom transfer radical polymerization processes. Therefore, motivated by the expectation of success of preparing a star or a multi-arm structure of Patten et al. (page 901, Figure 1), it would have been obvious to one of ordinary skill in art to incorporate the star or multi-arm structure of Patten et al. to obtain the invention of claims 151-158, 271-272.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William K. Cheung, Ph. D.

Primary Examiner

May 12, 2006

WILLIAM K. CHEUNG
PRIMARY EXAMINER